CLAIMS

1. A semiconductor device having at least one silicon carbide-containing layer which has been stabilized against substantial mechanical and thermal degradation, which comprises

(a) a silicon carbide-containing semiconductor substrate having a first and second major surface; and

(b) an encapsulating insulative coating layer formed onto at least one of the first and second major surface of said silicon carbide-containing semiconductor substrate which protects said semiconductor device from mechanical degradation and from thermal degradation at temperatures above at least about 1000 °C.

2. A device according to claim 1 including a ceramic substrate having first and second major surfaces, and

an adhesive layer adhering one of the major surfaces of the silicon carbide substrate to one of the major surfaces of the ceramic substrate,

the adhesive layer being stable to over 1000°C.

3. A device according to claim 2 in which the coating layer is borosilicate glass.

4. A device according to claims 3 in which the adhesive layer is borosilicate glass and the ceramic substrate includes a layer of AlN.

5. A semiconductor device having at least one Si carbide-containing layer bonded to an underlying substrate which has been encapsulated and stabilized against substantial mechanical and thermal degradation, which comprises;

(a) a Si carbide-containing semiconductor substrate having a first and second major surface;

(b) an underlying substrate having a first and second major surface; and

(c) an adhesive-encapsulating coating layer which bonds at least one of the first and second major surface of said Si carbide-containing semiconductor substrate to one of the first and second major surface of said underlying substrate and which is

coated onto at least one of the first and second major surface of said Si carbide-containing semiconductor substrate;

said bonded SiC-containing substrate-underlying substrate structure and coating layer being formed without substantial mechanical or thermal degradation at temperatures less than 1000 °C. and the coating layer being operative for protecting said semiconductor device from mechanical degradation and from thermal degradation at temperatures above at least about 1000 °C.

6. A packaged SiC device which comprises

(a) a SiC die;

(b) a contact forming an electrical connection to the SiC die;

(c) a package substrate comprising a layer of AlN;

(d) a metal conductor on the package substrate connected to the contact; and

(e) a borosilicate glass layer adhering and interfacing the SiC die to the AlN package substrate.

7. A device according to claim 6 which further comprises a borosilicate glass layer which encapsulates the SiC die and the metal conductor or the AlN package substrate.

8. A device according to claim 6 wherein the metal conductor is made of tungsten.

9. A resistive thermal device comprising;

a ceramic layer having a major surface;

a metal layer on the major surface of the ceramic layer; and

a coating of borosilicate glass adhered to the major surface of the ceramic covering the metal layer.

10. A device according to claim 9 in which the ceramic layer is AlN.

11. A device according to claim 9 in which the ceramic layer is $Al_2 O_z$.

12. A device according to claim 9 in which the metal includes a Pt thin film.